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A review of *Banksia mucronulata* (Proteaceae)

Banksia mucronulata (R.Br.) A.R.Mast & K.R.Thiele is a non-lignotuberous shrub endemic to the south-west of Western Australia and comprising two recognised subspecies. *Banksia mucronulata* subsp. *mucronulata* occurs in the western and central parts of Stirling Range National Park and south to Albany and Cheyne Beach, and is not considered threatened. *Banksia mucronulata* subsp. *retrorsa* (A.S.George) A.R.Mast & K.R.Thiele is restricted to areas of remnant vegetation in the southern Wheatbelt region near the towns of Tambellup, Cranbrook and Broomehill (George 1996), and is gazetted as Declared Rare (Threatened) Flora under the *Western Australian Wildlife Conservation Act 1950* and ranked as Critically Endangered.

George (1996) discriminated the two subspecies, which at that time were thought to be geographically disjunct, based on differences in perianth length, pistil length, leaf width, sinus shape and the presence or absence of retrorse lobes on the leaves subtending inflorescences (Table 1). However, the discovery of a further three populations in the years since George's treatment and the collection of additional specimens of both subspecies has reduced their geographic and morphological disjunction, raising questions on the validity of the subspecies. Therefore, a detailed morphological study was undertaken to clarify the circumscription of the taxa.

Table 1. Morphological differences between *Banksia mucronulata* subsp. *mucronulata* and subsp. *retrorsa* (after George 1996)

	subsp. *mucronulata*	subsp *retrorsa*
Leaf width (mm)	5–12	4–7
Sinus shape	V	U
Sinus width (mm)	3–6	2–5
Lobe orientation of leaves subtending inflorescence	straight	retrorse
Perianth length (mm)	15–20	27–30
Pistil length (mm)	20–25	34–38

Examination of 81 specimens of subsp. *mucronulata* and 29 specimens of subsp. *retrorsa* found the species to be variable both within populations and across its geographic range, with many collections morphologically intermediate between the two subspecies (Table 2; Figure 1). Collections from the Cranbrook and Tunney area generally have narrower leaves and larger flowers than those occurring further south and east. However, this is not consistent and some specimens from that area have broad or narrow leaves and small flowers. Indeed, there is considerable overlap between the two subspecies in leaf width, with widths of 4–12 mm occurring across the species' range. Retrorse lobes on the

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leaves subtending the inflorescence are most common in populations of subsp. *retrorsa* and southern coastal populations of subsp. *mucronulata* but are also present throughout the geographic range of both subspecies. Perianth and pistil lengths intermediate between those reported by George (1996) are common in Threatened Flora populations 3, 4, 5 and 7 (Phillimore *et al.* 2003) near Broomehill, Tambellup and Tunney. Across all locations and both subspecies, sinus shape and width are variable, both within and between specimens.

Table 2. Morphological comparison of specimens from selected *Banksia mucronulata* locations.

Location	Cranbrook & Weir Rd	Tunney & Flat Rocks Rd	Mt Toolbrunup	Albany	Two Peoples Bay & Cheyne Beach
Population (Threatened Flora)	1 & 2	3, 4, 5 & 7			
Lobe orientation of leaves subtending inflorescence	predominantly retrorse	straight & retrorse	straight & retrorse	predominantly straight	straight & retrorse
Leaf width (mm)	4–7(–12)	4–12	(4)5–12	4–12	4–12
Pistil length (mm)	20–34(–38)	(20–)26–34(–38)	20–25	20–25(–36)	20–25

Conclusion. The morphological variation found in recent collections of *B. mucronulata* across its geographic range shows that there are no consistent differences between the two subspecies. Therefore, *B. mucronulata* subsp. *retrorsa* is here reduced to synonymy under *B. mucronulata*.

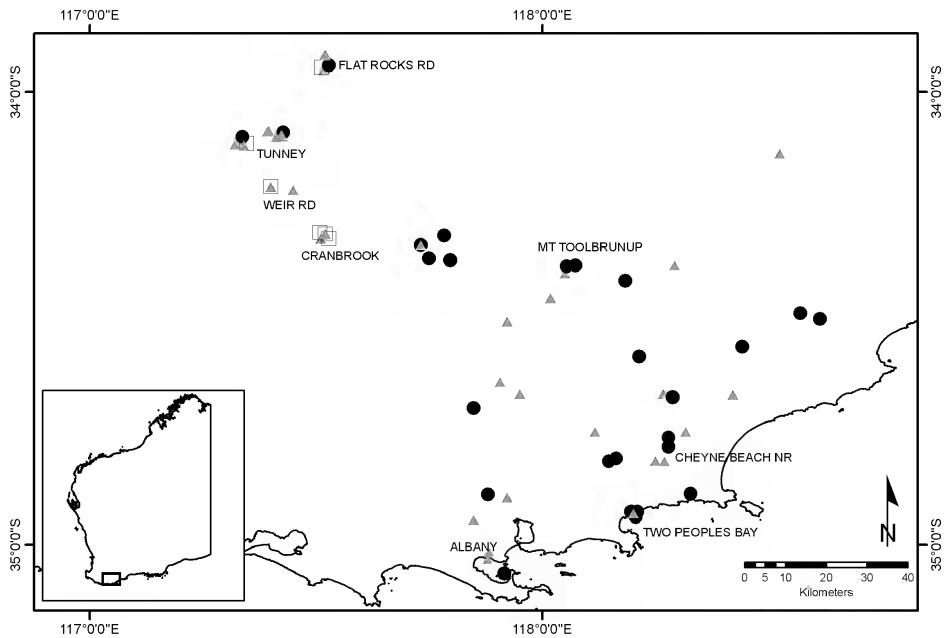

Figure 1. Distribution of *Banksia mucronulata* specimens examined. Collections indicative of subspecies *mucronulata* (●); subspecies *retrorsa* (□); and intermediate between the two (▲).

Banksia mucronulata is known from over 15,000 km^2 and in at least 50 locations and does not require a conservation rating.

Selected specimens examined. WESTERN AUSTRALIA: [previously referred to *B. mucronulata* subsp. *mucronulata*] Twin Creeks Conservation Reserve Plantagenet Loc. 6889, 25 July 2005, *A. Burchell* 714 (PERTH); near beginning of nature trail, Mt Adelaide, Albany, 6 Jan. 1985, *E.J. Croxford* 4446 (PERTH); hill above Bettys Beach, off Hassell Hwy, Albany E, 18 July 1987, *E.J. Croxford* 5663 (PERTH); side of North Woogenilup [Woogenilup North] Rd (flora road), 20 km E of Mount Barker, 4 Feb. 1997, *R. Davis* 2492; Nymbup Rd, 700 m W of Binniup Rd, WSW of Tambellup, 8 Aug. 2000, *B. Loudon* BLO 31 (PERTH); 5 miles S of Mount Toolbrunup, 18 Aug. 1963, *K.R. Newbey* 863 (PERTH); [previously referred to *B. mucronulata* subsp. *retrorsa*] private property of N.J. & A. Witham, Flat Rocks Rd, 9.1 km S of Broomehill–Kojonup Road, SW of Broomehill, 27 July 2000, *B. Loudon* BLO 27 (PERTH); private property of N. & E. Burges, Tunney Hall Rd, Tunney, 28 Aug. 2001, *B. Loudon* BLO 56 (PERTH); reserve on 'Trevelyn' farm (J. & K. Spriggs), Weir Rd, S of Kojonup, 10 Nov. 1999, *M. Pieroni* 99/20 (PERTH); Albany Hwy, 300 m N of southern Cranbrook turnoff on E side, 24 Aug. 2009, *M. Strelein* 331/1/1 (PERTH); Kojonup Loc. No. 3939, Tambellup, 28 Aug. 2009 *M. Strelein* 331/3 (PERTH); Kojonup Loc. No. 1281, Cranbrook, 28 Aug. 2009, *M. Strelein* 331/7/1 (PERTH).

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References

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